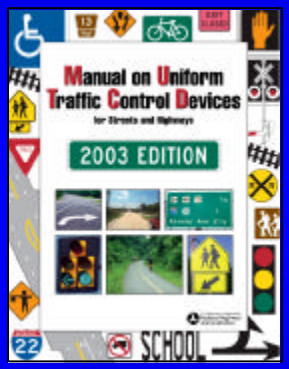
MUTCD Orientation Training

Caltrans, Local Agency & TCD Practitioners
January 28, 2005



+

Matt Schmitz, FHWA
Johnny Bhullar, Caltrans

Johnny Bhullar, P.E., T.E.

State of California
Department of Transportation
Caltrans, Division of Traffic Operations
Office of Signs, Markings & Permits
1120 N Street, Sacramento CA 95814

(916) 654-7312
CALNET 464-7312
FAX (916) 653-3055
johnny_bhullar@dot.ca.gov

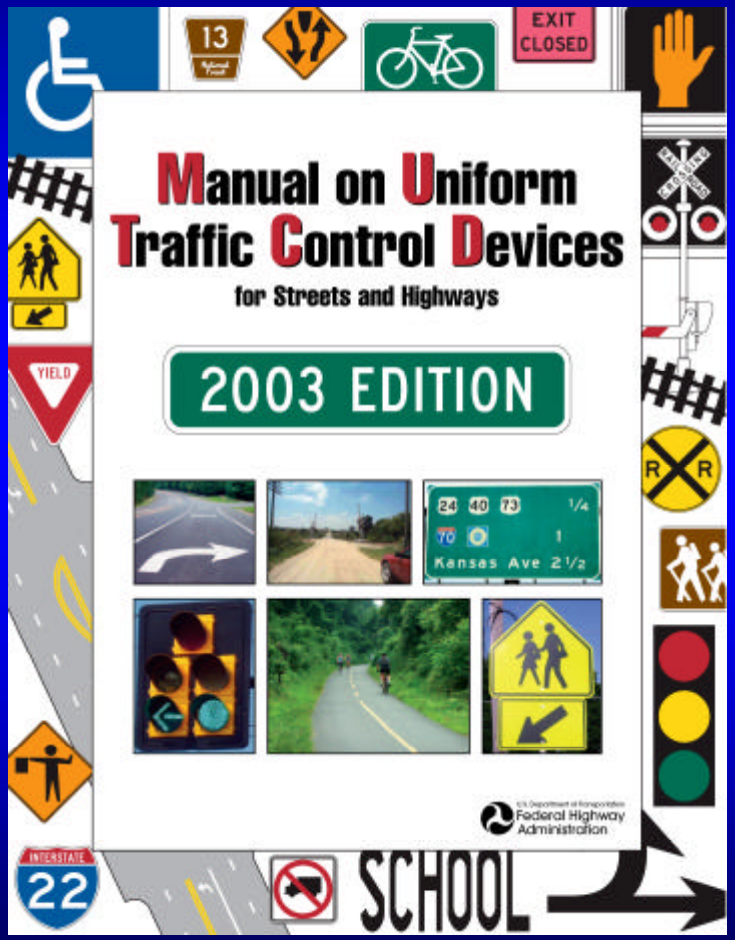
U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

MATTHEW SCHMITZ, P.E.
Safety/Traffic Engineer

CALIFORNIA DIVISION
650 Capitol Mall, Suite 4-100
Sacramento, CA 95814

(916) 498-5850
FAX (916) 498-5008
matthew.schmitz@fhwa.dot.gov

What is the MUTCD?



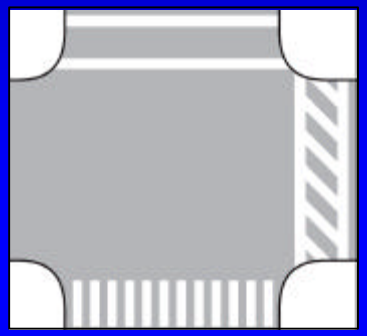
National MUTCD

National standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel.

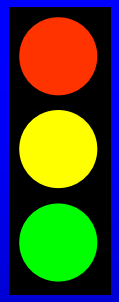
Types of TCDs

- Signs - Part 2

- Markings - Part 3



- Signals - Part 4



- Other MUTCD Parts are “Situational” use of TCDs
  - Work Zones, School Zones, RR Grade Xings

Definitions

Traffic Control Device – Sign, signal or Marking

- Regulatory, Warning or Guide

Road User – Motorist, Bicyclist, Pedestrian

MUTCD Applies to…..

Freeways

Residential Streets

Privately-owned parking lot

MUTCD Applies to any facility open to public travel!

MUTCD Parts

- 1 General Provisions
- 2 Signs
- 3 Markings
- 4 Highway Traffic Signals
- 5 Traffic Control Devices for Low Volume Roads
- 6 Temporary Traffic Control
- 7 Traffic Controls for School Areas
- 8 Traffic Control for Highway-Rail Grade Crossings
- 9 Traffic Controls for Bicycle Facilities
- 10 Traffic Controls for Highway-LRT Grade Crossings

MUTCD Format

Section 2C.11 Truck Rollover Warning Sign (W1-13)

Option:

A Truck Rollover Warning (W1-13) sign (see Figure 2C-1) may be used to warn drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a curve or turn having geometric conditions that are prone to cause such vehicles to lose control and overturn.

Standard:

When the Truck Rollover Warning (W1-13) sign is used, it shall be accompanied by an Advisory Speed (W13-1) plaque indicating the recommended speed for vehicles with a higher center of gravity.

Option:

The Truck Rollover Warning sign may be displayed either as a static sign, a static sign supplemented by a flashing warning beacon, or as a changeable message sign activated by the detection of an approaching vehicle with a high center of gravity that is traveling in excess of the recommended speed for the condition.

Support:

The curved arrow on the Truck Rollover Warning sign shows the direction of roadway curvature. The truck tips in the opposite direction.

Section 2C.12 Hill Signs (W7-1, W7-1a, W7-1b)

Guidance:

The Hill (W7-1) sign (see Figure 2C-2) should be used in advance of a downgrade where the length, percent of grade, horizontal curvature, and/or other physical features require special precautions on the part of road users.

The Hill sign and supplemental grade (W7-3) plaque (see Section 2C.48) used in combination, or the W7-1b sign used alone, should be installed in advance of downgrades for the following conditions:

A. 5% grade that is more than 900 m (3,000 ft) in length;
B. 6% grade that is more than 600 m (2,000 ft) in length;
C. 7% grade that is more than 300 m (1,000 ft) in length;
D. 8% grade that is more than 230 m (750 ft) in length; or
E. 9% grade that is more than 150 m (500 ft) in length.

These signs should also be installed for steeper grades or where crash experience and field observations indicate a need.

Text Headings

- Standard (“shall”) – required; no exceptions
- Guidance (“should”) – recommended; engineering judgment or study
- Option (“may”) – permissive
- Support - informational statement

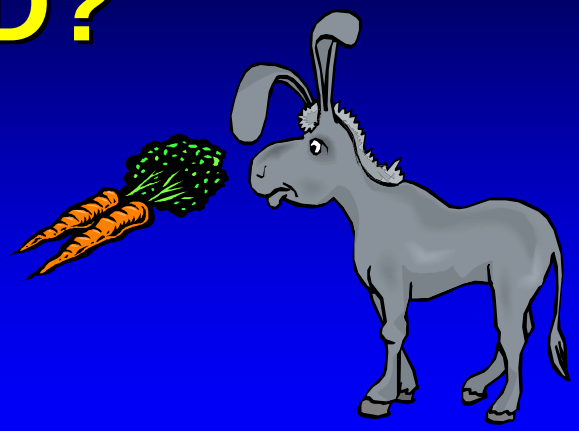
Let's talk about the TCD Exception Process…

THERE ISN'T ONE!!!

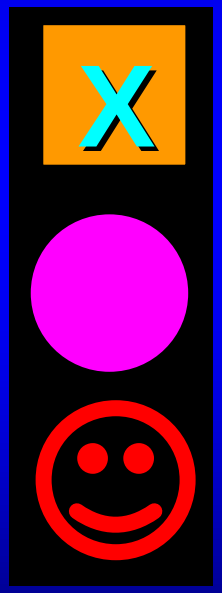
- **Standard: No Deviations**
- **Guidance: May deviate based on your engineering judgement or study**

  - Good idea to document

Why the MUTCD?



TCD uniformity promotes highway safety and efficiency (1927)



- Signs, Markings, Signals
- Regulatory, Warning, Guide

The MUTCD isn't just FHWA's opinion…

National Committee on Uniform Traffic Control Devices (NCUTCD)

- Two meetings per year
- 200+ volunteers
- Different experiences and backgrounds
  (Public, private, vendors)
- Different geographic perspectives

- Analogous to the California Traffic Control Devices Committee

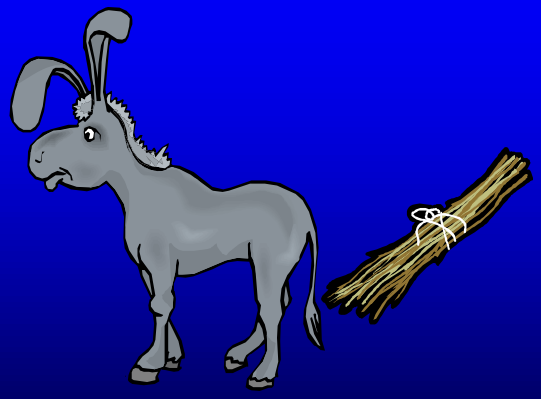
Why the MUTCD?

Federal law requires States to adopt the National MUTCD

OR

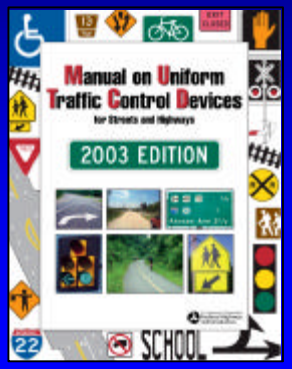
States may adopt a manual that is in *'substantial conformance'* with the MUTCD:

- **State MUTCDs**
- **Supplements**



Meeting the MUTCD Requirement

- National MUTCD

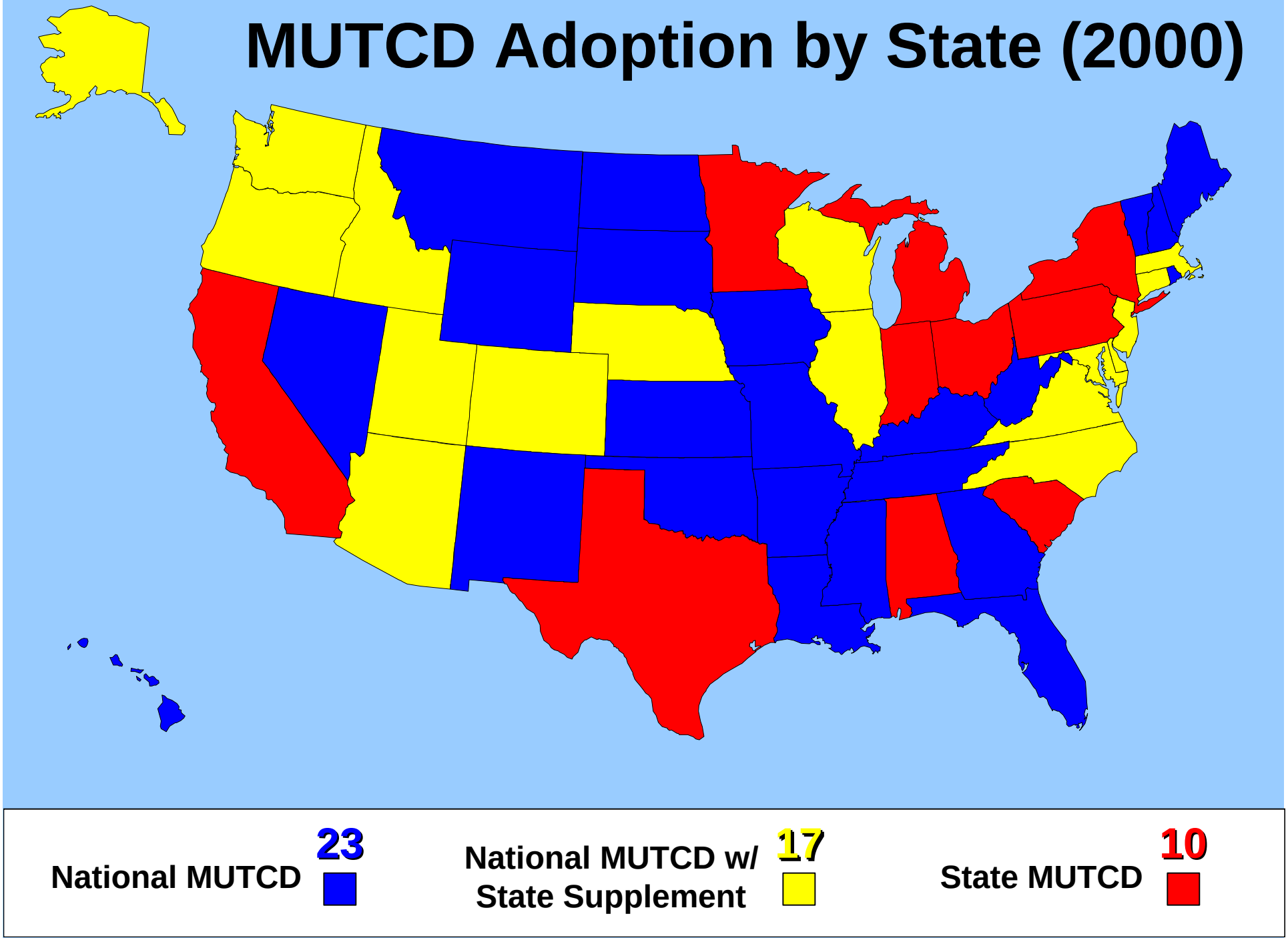


- National MUTCD + Supplement

+

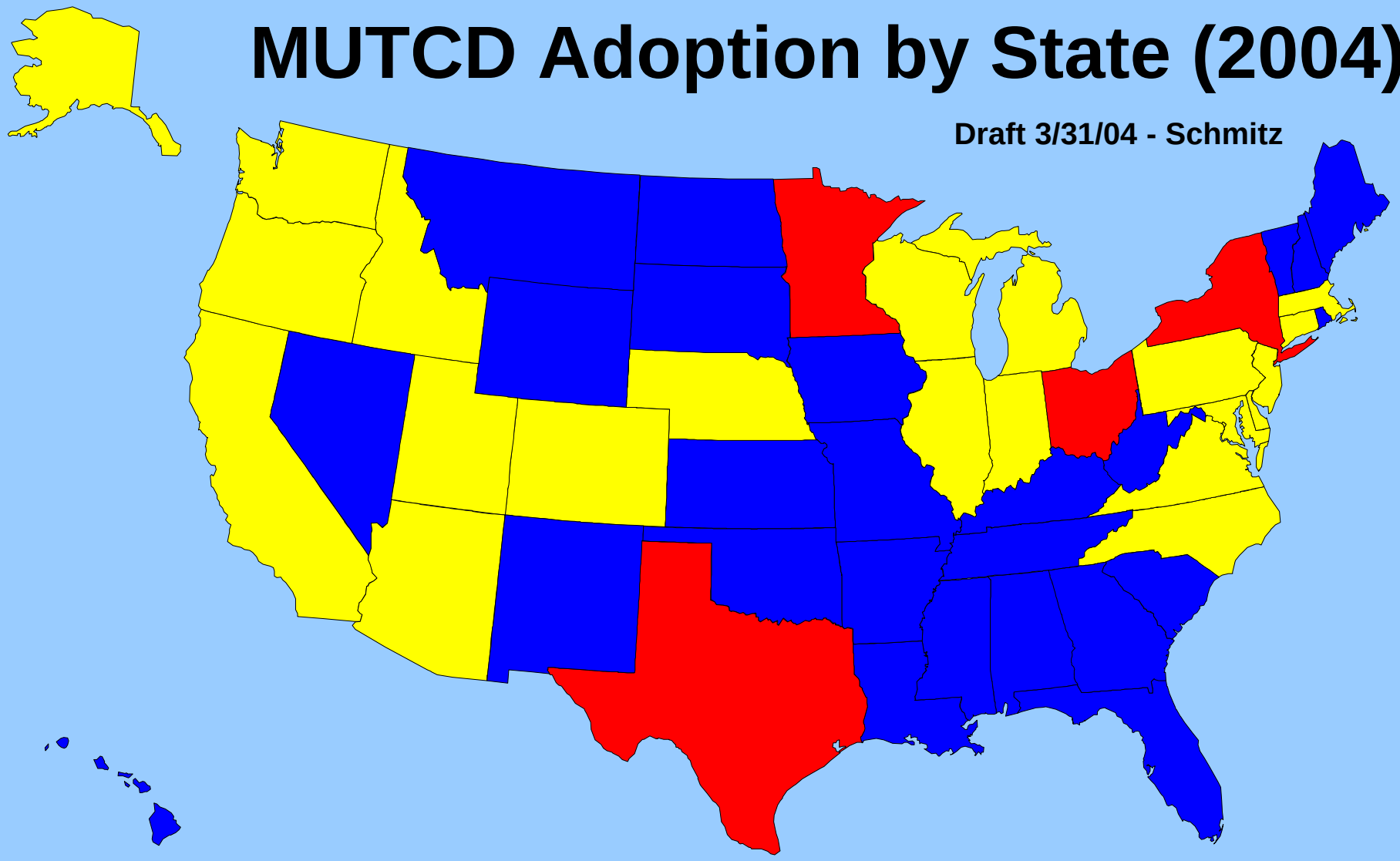
- State MUTCD

MUTCD Adoption by State (2000)



MUTCD Adoption by State (2004)

Draft 3/31/04 - Schmitz

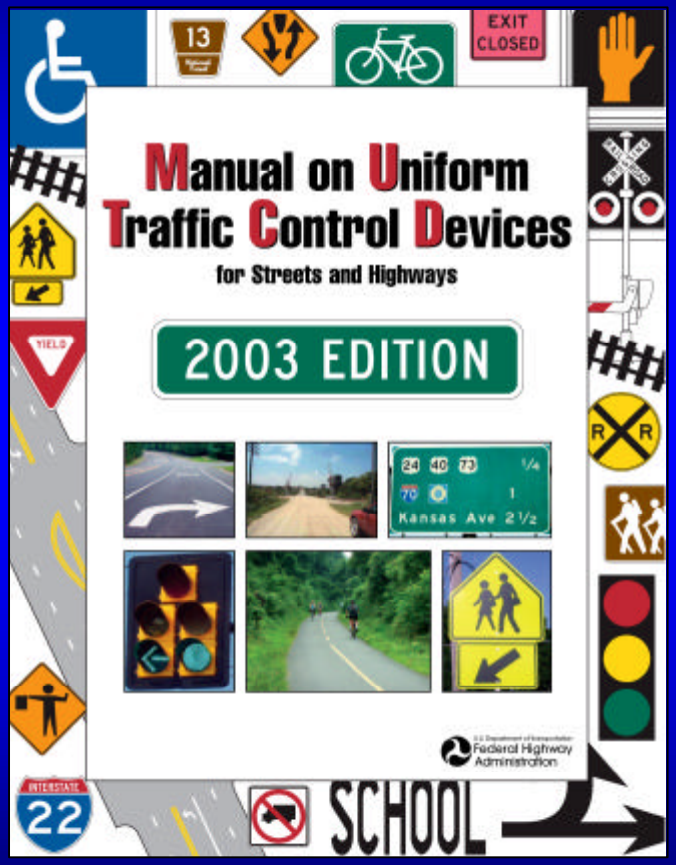


National MUTCD **25 (+2)**

National MUTCD w/ State Supplement **21 (+4)**

State MUTCD **4 (-6)**

MUTCD 2003



- Hard copies and CD-ROMs available from ATSSA, ITE, AASHTO
- Electronic version is the official FHWA publication
- mutcd.fhwa.dot.gov
  (But use CA Supplement Website)

Evolution of MUTCD

Year	Name	Month / Year Revised
1927	Manual and Specifications for the Manufacture, Display, and Erection of U.S. Standard Road Markers and Signs (for rural roads)	4/29, 12/31
1930	Manual on Street Traffic Signs, Signals, and Markings (for urban streets)	No revisions
1935	Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)	2/39
1942	Manual on Uniform Traffic Control Devices for Streets and Highways — War Emergency Edition	No revisions
1948	Manual on Uniform Traffic Control Devices for Streets and Highways	9/54
1961	Manual on Uniform Traffic Control Devices for Streets and Highways	No revisions
1971	Manual on Uniform Traffic Control Devices for Streets and Highways	11/71, 4/72, 3/73, 10/73, 6/74, 6/75, 9/76, 12/77
1978	Manual on Uniform Traffic Control Devices for Streets and Highways	12/79, 12/83, 9/84, 3/86
1988	Manual on Uniform Traffic Control Devices for Streets and Highways	1/90, 3/92, 9/93, 11/94, 12/96, 6/98, 1/00
2000	Manual on Uniform Traffic Control Devices for Streets and Highways — Millennium Edition	7/02
2003	Manual on Uniform Traffic Control Devices for Streets and Highways	

MUTCD Versions & their applicability in CA

Version	Released	Adopted
MUTCD 2000	12/20/00	Never
MUTCD 2000 Errata No. 1	6/20/01	Never
MUTCD 2000 Revision No. 1	12/20/01	Never
MUTCD 2003	11/20/03	5/20/04
MUTCD 2003 Revision No. 1	5/10/04	Not Yet

California website clearly shows which version applies in California

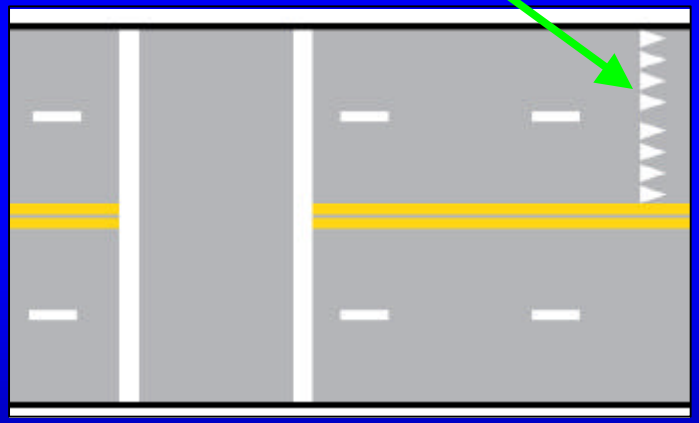
Communication

Primary Characteristics?

Words

Color

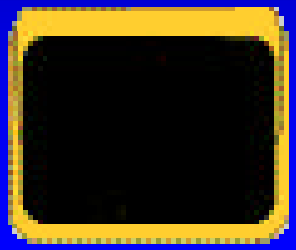
Shapes



Symbols

Communication (cont'd.)

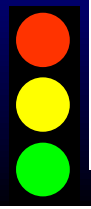
Variations: Flashing (Signals, Beacons, LEDs)



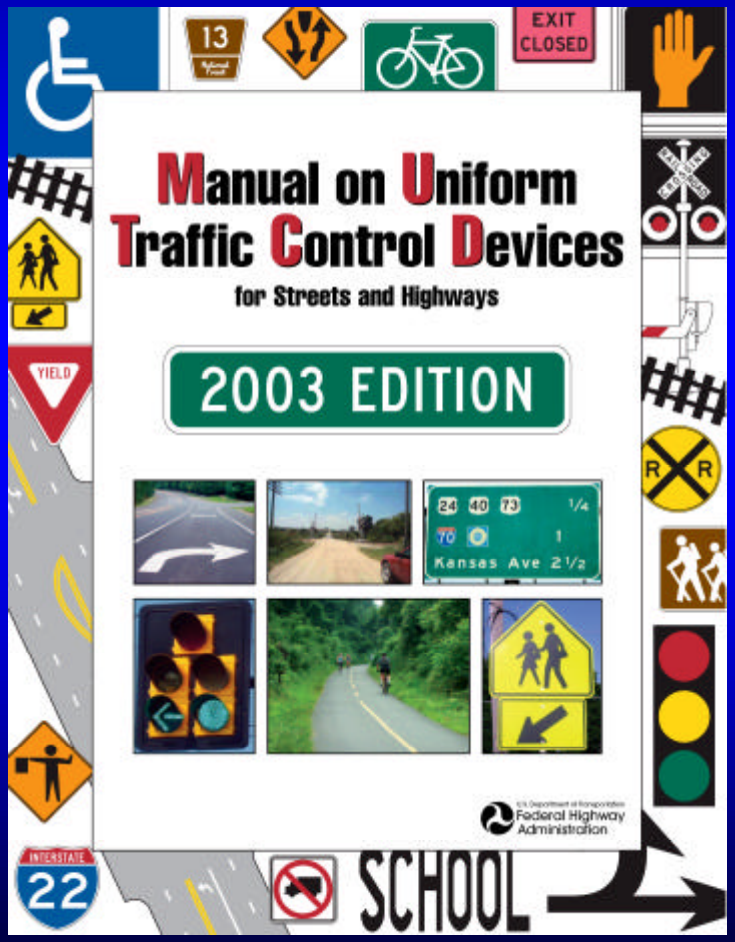
Not just visual:

Vibro-tactile (Accessible Ped Signal)

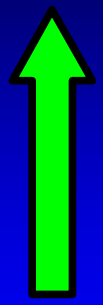
Cuckoo - Chirp



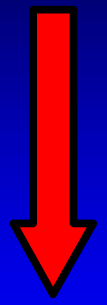
Is the MUTCD ‘Untouchable’?



MUTCD Language

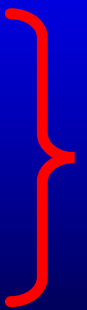


- Standard
- Guidance
- Option
- Support



TCD Characteristics

- Shapes
- Colors
- Symbols
- Word Messages

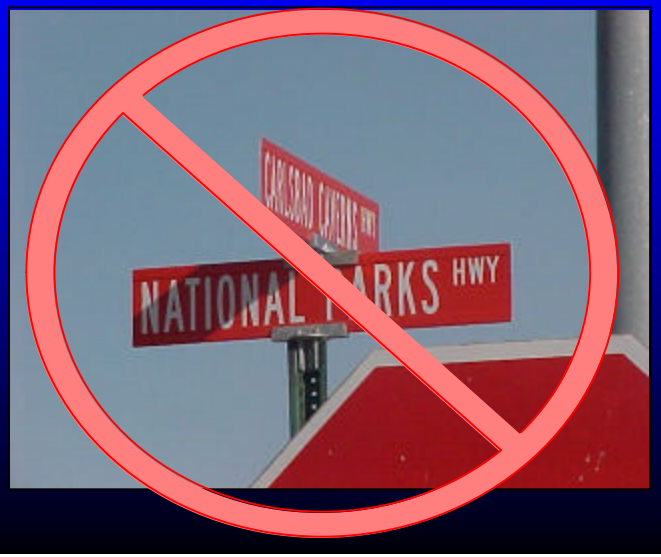


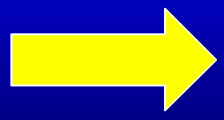
Latitude with State Manuals & Supplements

Acceptable – MUTCD Language

More Stringent

- From ‘Should’ to ‘Shall’ be White on Green



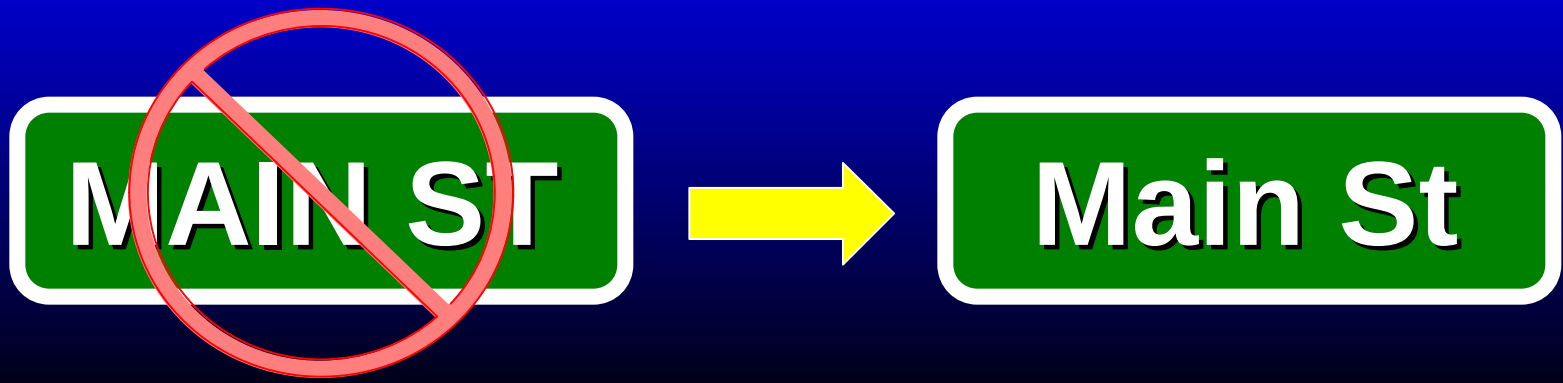


Latitude with State Manuals & Supplements

Acceptable – MUTCD Language

Choosing options

- **Example: "Street Name Signs may be all caps or upper/lower case."**



Latitude with State Manuals & Supplements

Unacceptable – TCD Characteristics

- Shape
- Color
- Symbol

Shape

Unacceptable – TCD Characteristics

Example of reserving shape for specific use (Round Shape)

MUTCD 2000

MUTCD 2003

Color

Example of reserving color for specific use (FYG)

Prefer Symbols to Word Messages

MUTCD -

"STANDARD: All new pedestrian signals shall consist of symbolized messages."

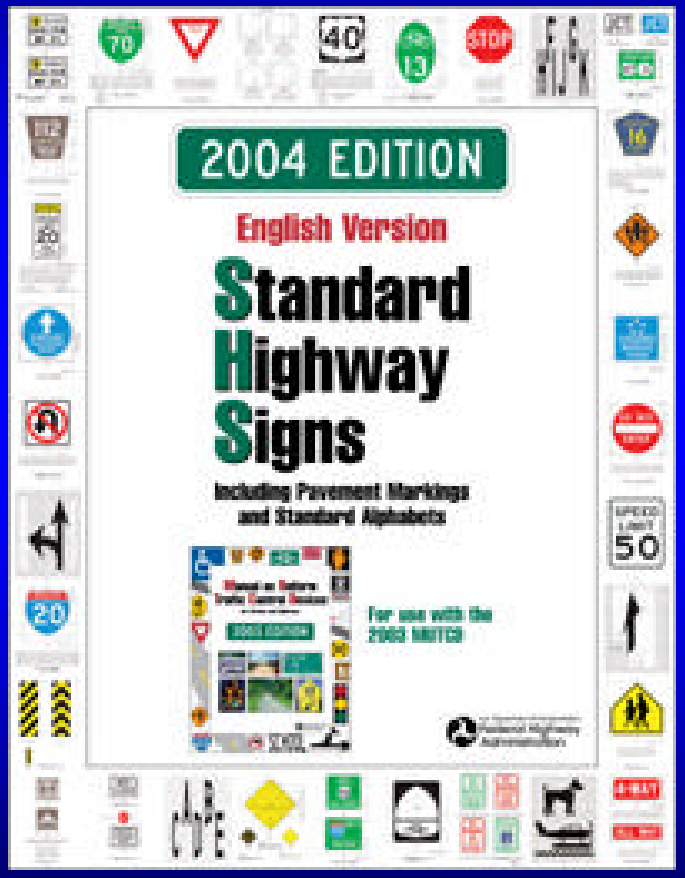
Symbol

Unacceptable – TCD Characteristics

Unapproved symbols

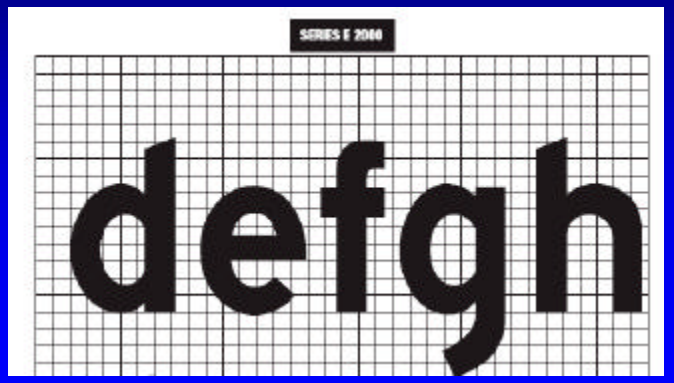
(not in SHS)

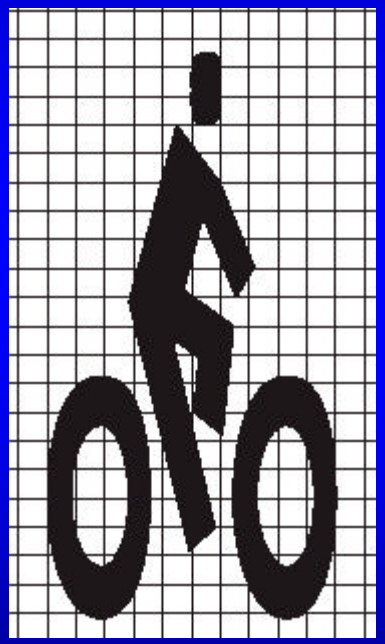
Standard Highway Signs Book 2004

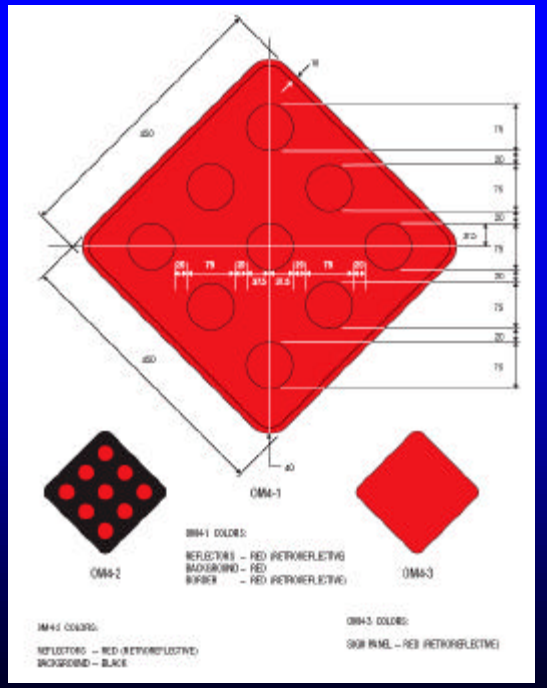


- Details for symbols, shapes, colors, dimensions, legends
- Standard Alphabets 2000
- Metric and English versions
- http://mutcd.fhwa.dot.gov

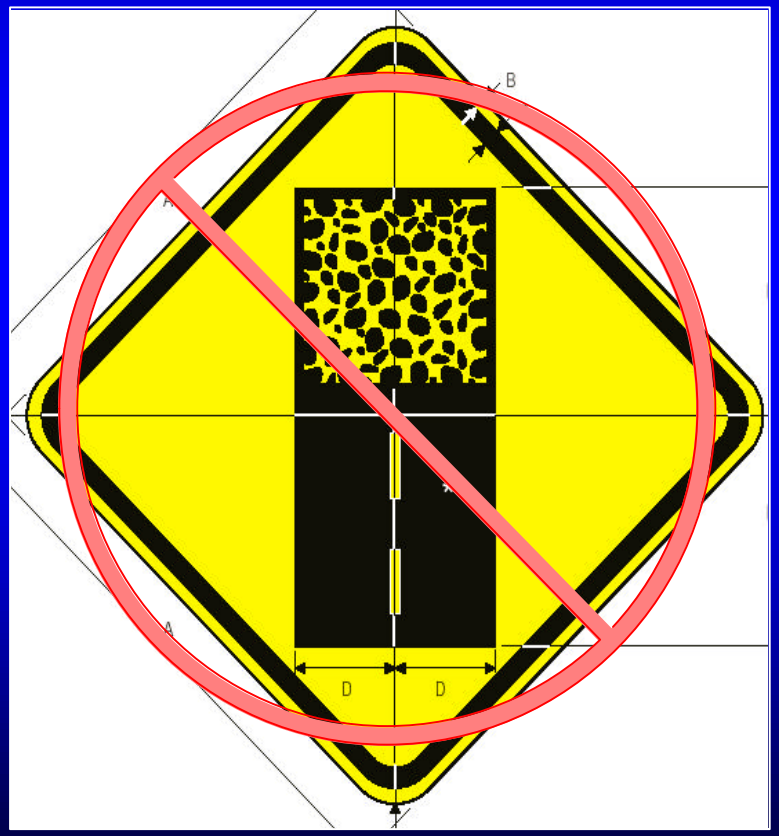
SHS Book





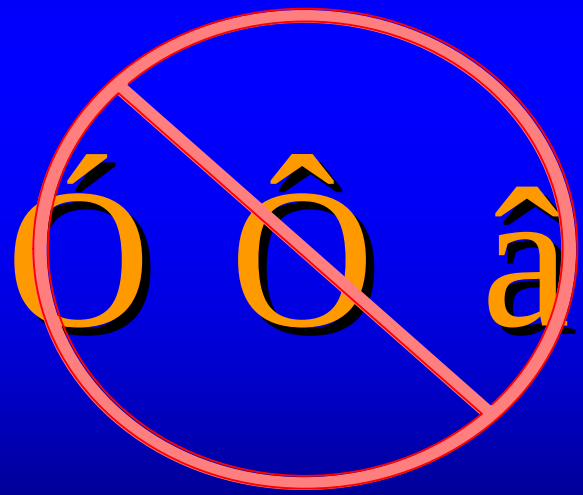


Admit our ‘Mistakes’



Copyright & Patent Info

- Copyrighted or patented devices not allowed



- TCDs considered public domain

Copyrights

Only exception to "No Copyrights" rule

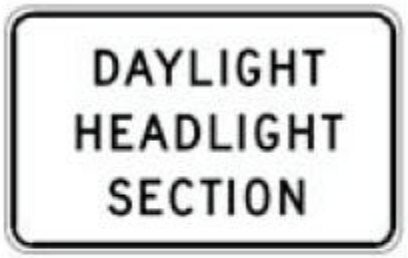
Latitude with State Manuals & Supplements

Acceptable – TCD Characteristics

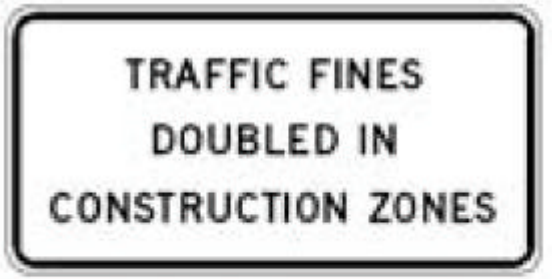
MUTCD allows creation of Word Message Signs not already addressed in MUTCD

CA-Only Word Message Signs

SW38



S30-1



C40

SW50

SR58

SR22-1

Experimental Word Message Signs

However, CVC more stringent than MUTCD. Thus, new word message signs in California require CTCDC/Caltrans approval.

Standard Alphabets

(Standard fonts found in SHS Book)

Non-Compliant TCDs

FHWA responsible for developing the standards contained in the MUTCD

Owner (State/local/private) responsible for the selection, installation, and maintenance of TCDs

Why Comply?

- Highest B/C of any safety improvement (20-60:1)

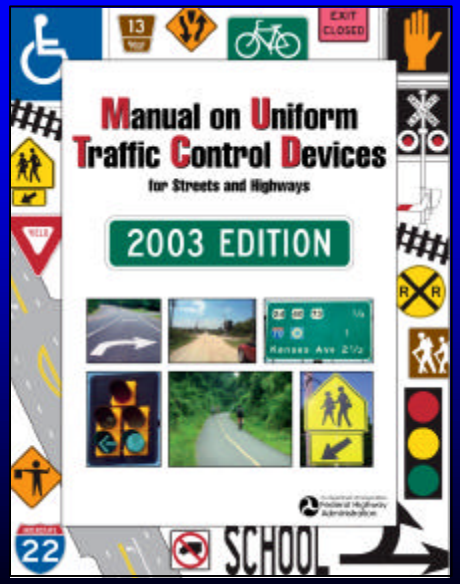
- 29% of tort liability lawsuits related to TCDs

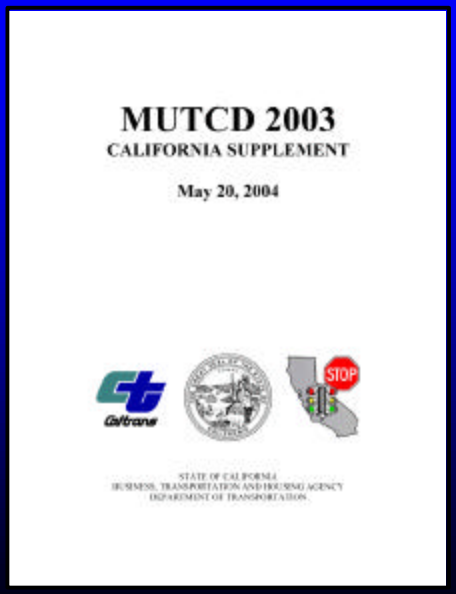
Compliance vs. Conformance

- ‘Compliance’ refers to Individual TCDs
- ‘Substantial conformance’ refers to Manuals
  - Traffic Manual or Supplement does not contain any non-compliant TCDs

Is the CA Supplement in *'substantial conformance'* with the MUTCD?

Even though State Supplements shall not any non-compliant TCDs, the CA Supplement is considered to be in substantial conformance.





CA Supplement Examples of "Non-Compliant" TCDs

In time, each non-compliant TCD will be addressed, but until then, these TCDs are "grandfathered and accepted for use in CA

“Deviations” from the MUTCD on the left are currently OK in California

CA Compliant - Approved policies in CA

CA Non-compliant – (NEVER approved in CA)

What causes non-compliant TCDs?

- Lack of awareness
- Pressure from “others” (Political Warrant)
- Desire for innovation

Innovative TCDs

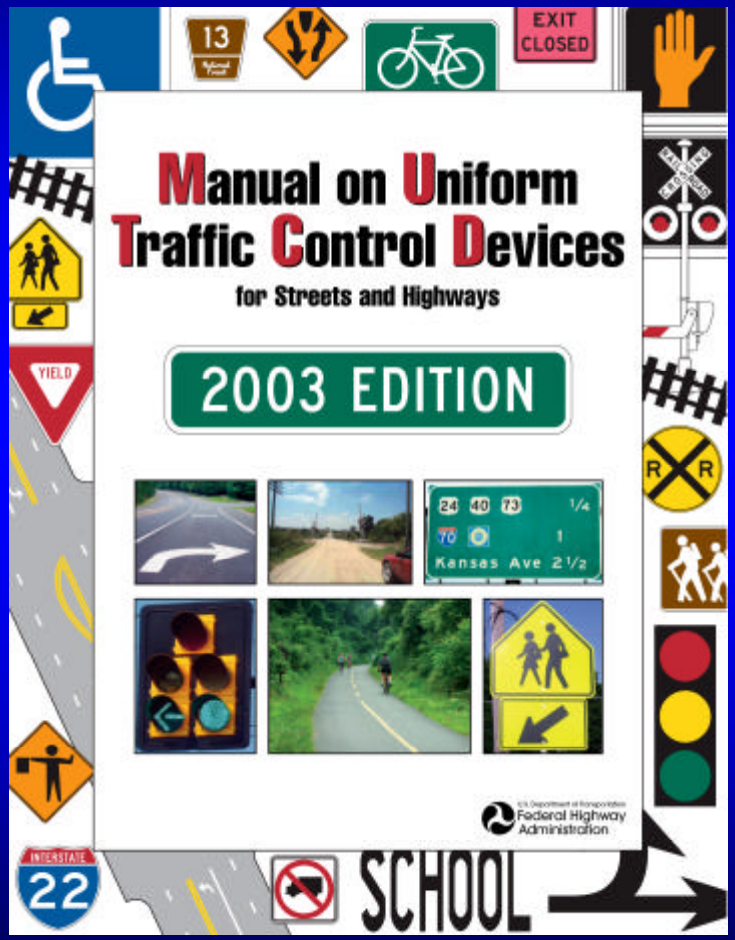
Innovation is good but need FHWA Approval to Experiment

FHWA is Open to Innovation!

New TCDs in 2003 MUTCD

New Signs in MUTCD 2003

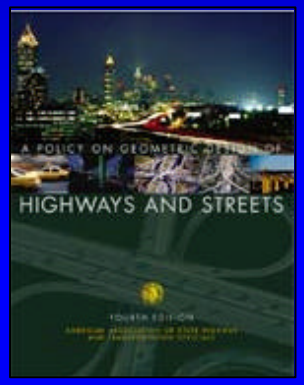
Using the MUTCD

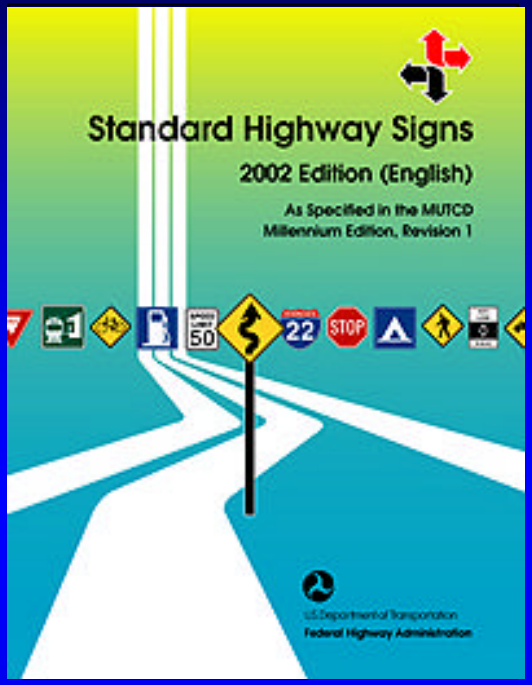


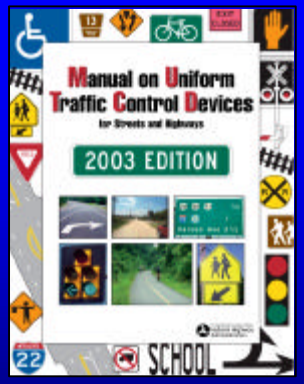
Not a stand-alone document

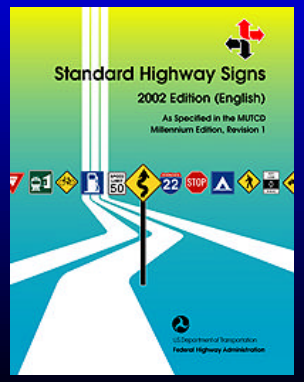
Is the Resource a Standard or Guide?

Standard

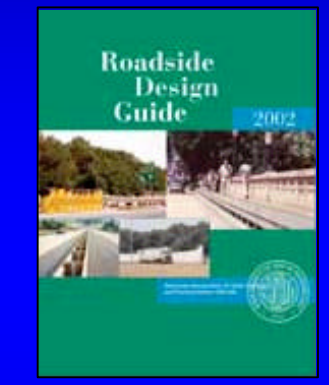


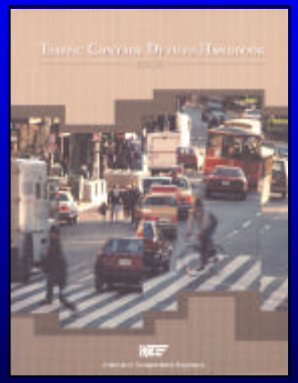




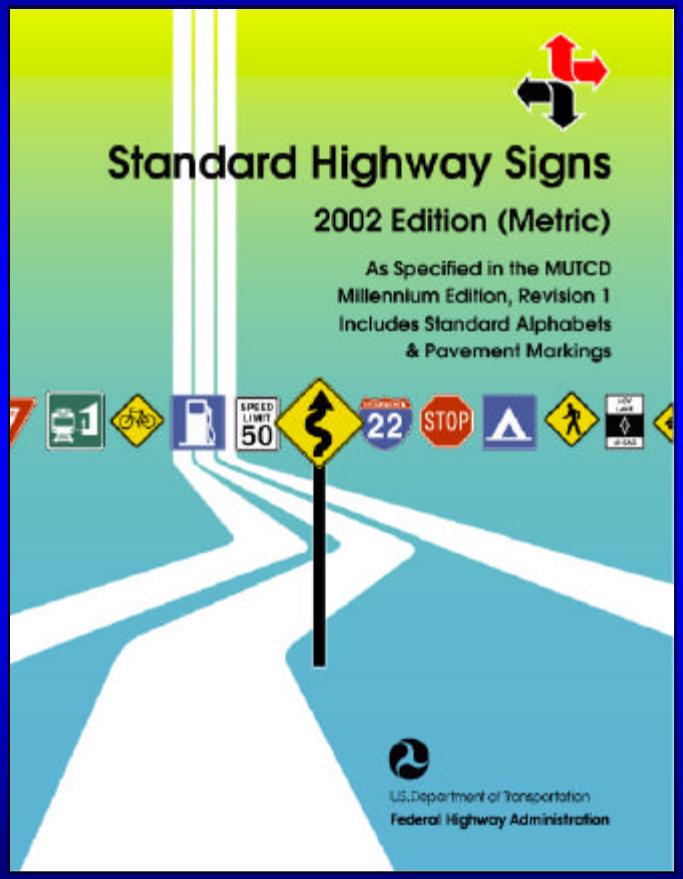


Guide



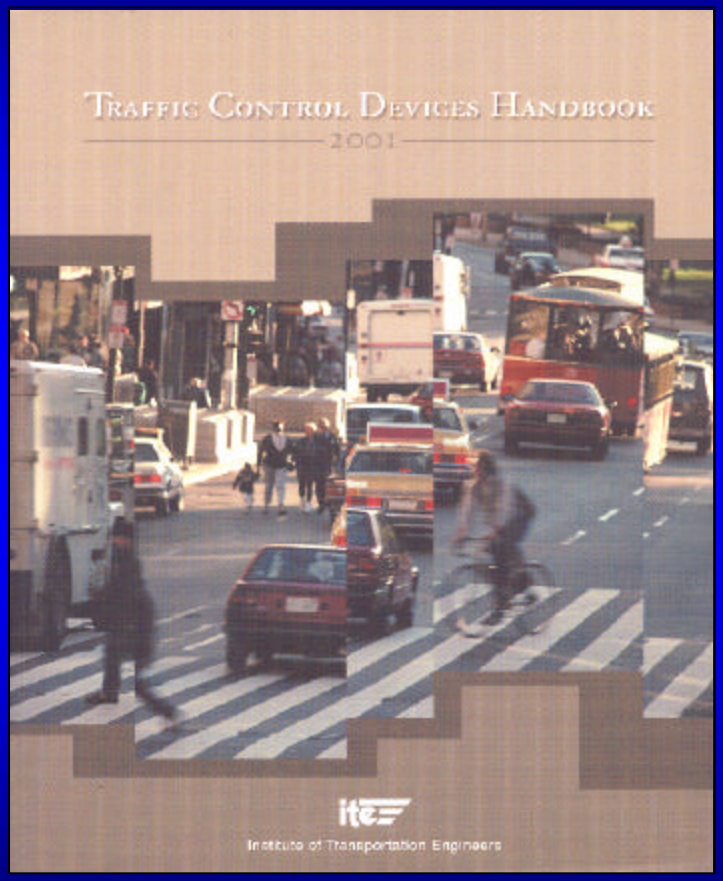


Standard Highway Signs Book 2002



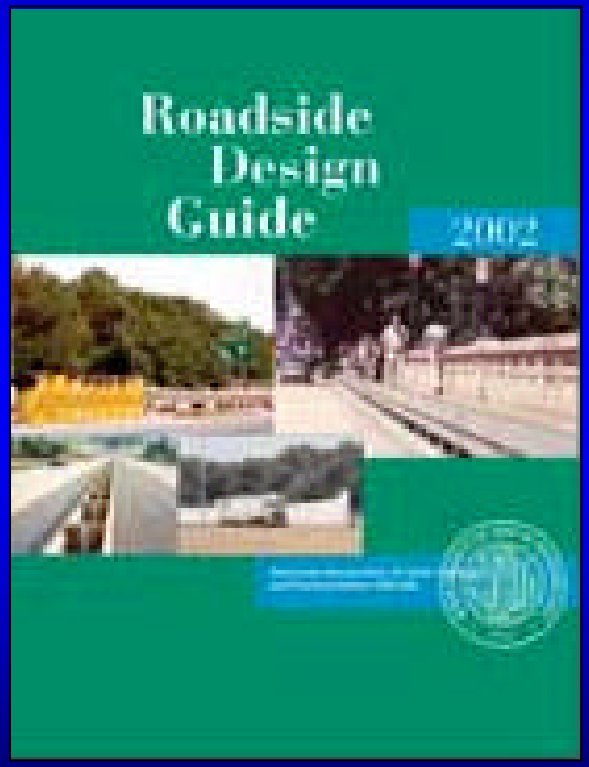
- Details for symbols, shapes, colors, dimensions, legends
- Standard Alphabets 2000
- Metric and English versions
- http://mutcd.fhwa.dot.gov

2001 TCD Handbook



- ITE Publication
- Replaces FHWA's 1983 TCD Handbook
- Supplements the 2000 MUTCD
- Updated on periodic basis

AASHTO Roadside Design Guide



Signs, Supports & Luminaires (Ch. 4)

Other TCD Resources

atssa.com/resources/letters.asp

- Interpretations and experiments

mutcd.fhwa.dot.gov/com_p2p.htm

- Hughson, CA requested guidance in placing signals at a five-point intersection